Dwarfs, Giants and Freaks Now Understood by Science

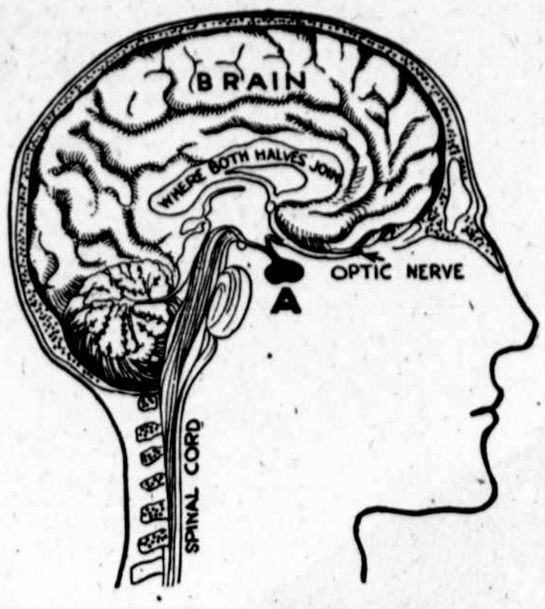
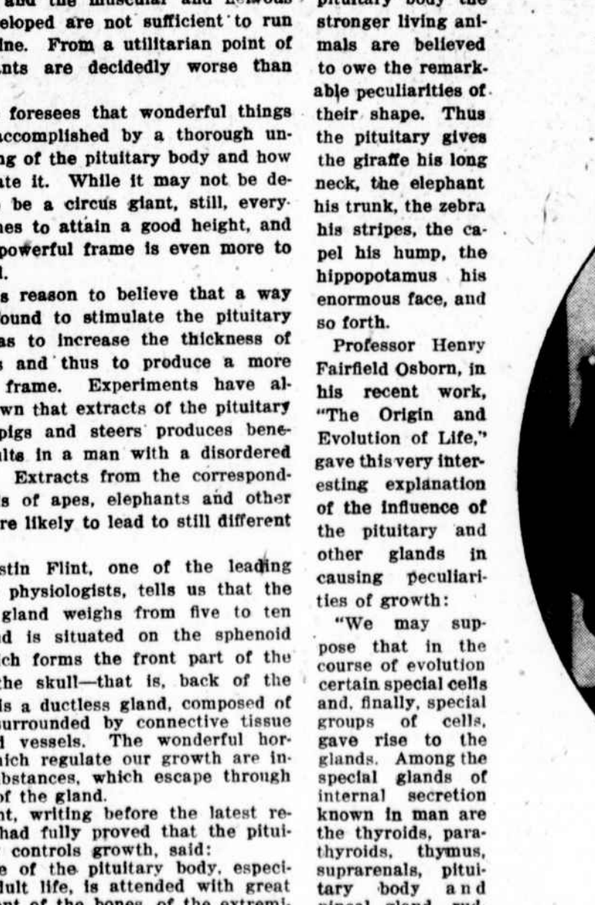


Diagram of Skull Showing One Hemisphere of the Brain and the Little But Vitally Important Pituitary Gland Marked "A."

Lady Constance Richardson, Whose Symmetry of Head, Features, Figure and Extremities Indicate a Pituitary Gland Working in Perfect Condition.

On a Little Gland the Size of a Cherry Hidden in the Middle of Your Head Depends How Tall You Grow—or Whether You Have Big Feet or Hideous Features

Miss Rose Wedsted, a Giantess Seven and a Half Feet Tall, Who Was the Unfortunate Victim of Hyperactivity of Her Pituitary Gland.



Little Mrs. Tom Thumb, Who Was Little Taller Than Her St. Bernard Dog. Her Growth Was Stopped by Disease of the Pituitary Gland in Childhood.

George Auger, the Well-Known Giant, Who Reached a Height of Nearly Eight Feet, the Result of Abnormal Activity of His Pituitary Gland.

SCIENCE has at last found out what it it is that makes giants and dwarfs and freaks, and also what makes a normal man the size he is, and keeps him from being as large as an elephant or as small as a mouse.

It is the "pituitary gland" in the base of the brain, a little body about the size and color of a cherry.

Professor Arthur Keith, speaking before the British Association for the Advancement of Science, summarizing the observations of many medical men and other scientists, declared recently that we must assign the principal influence in controlling the machinery of growth to the pituitary body.

Every man has wondered why he stops when he does, instead of stopping much sooner or continuing much longer.

Why should not a man keep on growisg all his life, or at least up to that period to which he retains his full physical strength? He might do so if it were not for the pituitary body, which has been perfected through countless ages of evolution to check the growth of man at that stage where he can do his work most efficiently.

Why should not a man stop growing immediately after he is born? The answer is the same—he might do so if it were not for the activity of the little pituitary body.

What prevents one arm of a child from growing long while the other stays short? The regulating influence of the pituitary body.

The most important evidence of the function of the pituitary body lies in the fact that this body is always found to be disordered in the bodies of giants and dwarfs.

The circus giant, like George Auger, who was eight feet high, whose size amazes you so much, owed his dimensions entirely to possessing an abnormally active pituitary gland.

Dwarfs, like Mr. and Mrs. Tom Thumb, no taller than a two-year-old baby, owed their tiny stature to having an undeveloped pituitary gland.

There are several disorders of the pituitary body besides those which produce "giantism" and "dwarfness." Chief among these is acromegaly, in which there is an abnormal growth of one part of the body only, such as the face, the hands or the feet. This occurs in thousands of persons and is often a very unhappy condition.

Even persons who are badly proportioned in figure must in many cases attribute their condition to a badly functioning pituitary gland. If this gland could be kept in perfect order from birth we should all grow into a race of Venuses and Adonises.

If the pituitary body were weak and uncertain in its action men would be a ridiculous race of ill-assorted beings, varying in size perhaps from a marmoset to an elephant. Such a condition prevails to a certain extent among the fish, in which the limit of full and mature growth is not fixed as definitely as in man. Everybody knows that from time to time fish are brought out of the sea immensely above the ordinary specimens of their race in size. A man is considered a giant when he is two feet above the average, but it is not uncommon to fish up halibut and lobsters that are fifty times the size of the average members of their species.

From these facts it will be seen that the pituitary body is of great importance in giving man supremacy over the inhabitants of the earth.

How does the pituitary body do its work in regulating growth? Recent studies have proved that the gland produces a fluid called a "hormone," which passes into the blood, which in a few minutes carries it throughout the body and applies it to the tissues.

There are many other forces producing growth—principally the nourishment taken into the body and digested, and the multiplication of body cells by self-reproduction. These forces are uncertain in their action and it requires the power of the pituitary secretion, and probably other secretions, to restrain them within the limit which is best for human efficiency.

If the pituitary gland supplies a continual overdose of "hormone," as it does in some cases, it will produce overgrowth. Giants are not of great value to society. The growth of their bones and tissues is carried to a point where the nourishment taken in and the muscular and nervous force developed are not sufficient to run the machine. From a utilitarian point of view, giants are decidedly worse than dwarfs.

Science foresees that wonderful things may be accomplished by a thorough understanding of the pituitary body and how to stimulate it. While it may not be desirable to be a circus giant, still, everybody wishes to attain a good height, and a broad, powerful frame is even more to be wished.

There is reason to believe that a way may be found to stimulate the pituitary body so as to increase the thickness of the bones and thus to produce a more powerful frame. Experiments have already shown that extracts of the pituitary body of pigs and steers produces beneficial results in a man with a disordered pituitary. Extracts from the corresponding glands of apes, elephants and other animals are likely to lead to still different results.

Dr. Austin Flint, one of the leading American physiologists, tells us that the pituitary gland weighs from five to ten grains and is situated on the sphenoid bone, which forms the front part of the base of the skull—that is, back of the eyes. It is a ductless gland, composed of vesicles surrounded by connective tissue and blood vessels. The wonderful hormones which regulate our growth are invisible substances, which escape through the wall of the gland.

Dr. Flint, writing before the latest researches had fully proved that the pituitary body controls growth, said:

"Disease of the pituitary body, especially in adult life, is attended with great enlargement of the bones, of the extremities and the features of the face, or what is known as acromegaly. When the disease occurs in early life, as development progresses there is a condition known as giantism, the individual sometimes reaching an enormous stature. That there is some relation between the pituitary body and acromegaly and giantism there can be no doubt, but the nature of this relation is obscure. In some cases of acromegaly improvement has been noted following the use of extract of the pituitary body."

In the functions of the pituitary body and some of the other ductless glands science believes that it has found the cause of the body forms of all the animals from man downward.

It was owing to the pituitary body that the gigantic nightmare shapes of the old antediluvian saurians, the brontosaurus, the stegosaurus, the ichthyosaurus and a thousand other species came into existence. Their pituitary glands poured forth vast quantities of secretion until their bodies grew to be one and two hundred feet long. This process went on until they became too large to exist.

To certain derangements of the pituitary body the stronger living animals are believed to owe the remarkable peculiarities of their shape. Thus the pituitary gives the giraffe his long neck, the elephant his trunk, the zebra his stripes, the camel his hump, the hippopotamus his enormous face, and so forth.

Professor Henry Fairfield Osborn, in his recent work, "The Origin and Evolution of Life," gave this very interesting explanation of the influence of the pituitary and other glands in causing peculiarities of growth:

"We may suppose that in the course of evolution certain special cells and, finally, special groups of cells, gave rise to the glands. Among the special glands of internal secretion known in man are the thyroids, parathyroids, thymus, suprarenals, pituitary body and pineal gland, rudiments of which doubtless occur in the very oldest vertebrates and even among their invertebrate ancestors. Some affect the growth of the entire organism, others certain parts; some arrest growth entirely, others stimulate growth at certain points only; and others again entirely change the proportions of certain parts of the body.

"Thus an injury to the pituitary body, which lies beneath the vertebrate brain, results in a stunted stature, marked adiposity and delayed or imperfect development. On the other hand, the diseased condition, rousing it to excessive function, is followed by a great increase in the general size of the head, as well as a complete change in the proportions of the face from broad to long and narrow, and the abnormal growth of the long limb bones, while at the same time the proportions of the bands are changed from normal to the short and broad condition. In other words, regulation and balance resulting in the normal size and proportions of certain growths of the skeleton are dependent upon chemical messengers coming from these glands."

Professor Osborn goes on to argue that the various races of mankind, the long-headed and short-headed, the long-legged Norwegians and the bow-legged Japanese, owe the peculiarities of their stature to the pituitary gland.

"We may instance in man," he says, "for example, the long head-form (dolichocephaly) and the broad head-form (brachycephaly), or the long-fingered form (dolichodactyly) and the short-fingered form (brachydactyly), which have broad fingers, as well as the proportions of many portions of many others parts of the body.

"Whether this is a mere coincidence of a heredity-chromatin congenital character with a mere bodily chemical messenger character it would be premature to say. It certainly appears that chemical interactions from the pituitary body control the normal and abnormal development of proportions in distant parts of the body."

The regulation of growth in a human being is a complicated problem. The pituitary gland is the supreme director, but other glands share in the work. Professor Keith says that the "pineal gland" must also be assigned a place in controlling growth.

This gland is situated within the brain back of and above the eyes, and is similar in composition to the pituitary body. Huxley and other Darwinians believed that it was the vestige of "a third eye" which man possessed in a former stage of evolution, but the recent researches concerning the ductless glands suggest that it has a real use to-day.

Their reasoning to explain the "rudimentary eye" took this form. Some very primitive ancestor of our race, an amphibian, lived a semi-aquatic life amid sylvan recesses and palaeozoic swamps. Under these conditions an eye on the top of its head was considered necessary to spot the tit-bits floating above it, or to see out of the mud; hence the pineal eye. But long ages afterward its human descendants left the arborial morass and began to till the earth and look for diamonds, so, of course, the need for an eye on the top of their heads did not exist.

Consequently, it shrank from disuse into a rudimentary fragment, an interesting relic of man's primeval past, like his troublesome vermiform appendix, third eyelid and os coccyx or "rudimentary tail." All this kind of reasoning received a surprising amount of credence among speculative scientists generally, more particularly when a windfall came their way in the person of sphenodon, illustrated at the top of the page, a most singular little reptile, two feet long, discovered on some islands off New Zealand, and called by the Maoris the tuatera. It was found that it had what was considered a pineal eye beneath a hole in the top of its skull, and though it was only rudimentary, like man's, yet here was evidence for the latter's ancestry. It was not held that man sprang from an ancient sphenodon, but from something far worse, the pelycosaur, that existed long ages ago. Its fossilized skeleton alone remains, but it possesses the identical hole in the top of its head for the pineal eye.

The chain of evidence appeared complete. This creature stood at the parting of the ways in the genealogical tree of descent, man being at the end of one branch and sphenodon at the end of the other. Since they both had a relic of a third eye, the inference was that they had a common ancestor, which was—so it was contended—the curious animal, the pelycosaur.

But the history of science shows that the day of theories is hard and slippery, and, though much is learned through them, they themselves often come to grief. In this case one end of the theory has given way, for man's rudimentary pineal eyes is believed by certain scientists, including Professor Keith, to be a part of the mechanism for regulating the size of man's head and so forth. But will the sphenodon still be accredited with a rudimentary pineal eye? Or is it but a gland to prevent it growing into twenty-foot alligator? Again, the question whether the pelycosaur ever saw through a third eye may remain a matter for entertaining speculation.